MAIN STREET BRIDGE
Main Street (State Route 138) over New Haven Railroad
South Kingstown
Washington County
Rhode Island

HAER No. RI-47

HAER
RI,
5-KING.S,
3-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Philadelphia Support Office
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

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Locetion: Main Street (State Route 138) over New Haven Railroad
South Kingstown
Washington County, Rhode Islend

USGS Quadrangle: Kingston, RI UTM: 19.286240.4595515

Engineer/Architect: Rhode Island State Board of Public Roeds

Febricator: Bethlehem Steel Company

Date of Construction: 1936

Present Owner: Stete of Rhode Island Department of Trensportetion
2 Capitol Hill
Providence, RI 02903

Present Use: ective highwey bridge

Significence: The Main Street Bridge is significent as en example of the stendardized concrete bridge design end replacement progrem initiated by Rhode Island Bridge Engineer Clerence L. Hussey during the 1920s, and is also significant as e well-preserved exemple of eerly twntieth-century hybrid bridge construction. The Main Street Bridge is elso evidence of the creation of, end improvements to, Rhode Islend's stete highwey trensportation system, es well as reilroed-related highwey improvamants, brought about by the emergence of the eutomobile and the resultant growth of the urben environment.

Project Informetion: The Netionel Railroed Passenger Corporetion (Amtrak), in association with the Federel Reilroed Administretion (FRA), is proposing a number of infrastructure projects to upgrede the Northeast Corridor Reilroed right-of-way in Connecticut, Rhode Islend, end Messechusetts. In consultation with the Stete Historic Praservetion Officers (SHPOs), Amtrak and FRA have determined that the proposed "Northeest Corridor Improvement Project—Electrification: New Heven, Connecticut to Boston, Messachusetts" project will heve edverse impacts on significent historic properties. Three memorande of egreement outlining stipuletions to eliminete, minimize, or mitigete edverse project impects heve been drefted by Amtrek, the FRA, end the respective SHPOs, end heve been accepted by the Advisory Council on Historic Preservation. The stipuletions include the recordetion of the Main Street Bridge to Historic Americen Engineering Record stenderds.

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PART I DESCRIPTIVE INFORMATION

The Main Street Bridge is located in a mixed commerciel-residentiel aree in South Kingstown, Rhode Islend end cerries Stete Route 138 (Main Street) over the Amtrak Northeast Corridor et Milepost 158.32.

The Main Street Bridge is e 135-foot, steel-and-concrete, multi-beem bridge consisting of three spens: a 65-foot central, main track spen, and two 35-foot approach spans. The bridge is oriented at a 63-degree skew to the reilroed trecks. The totel length of the bridge, including the epproech wells, is 310 feet. The bridge deck has an overall width of 52 feet including railings, and the roedway is 40 feet wide betwean curbs, which guerd five-foot sidewelks on each side of the roed. The spens rest on two full-width, solid, reinforced concrete pier wells loceted either side of the two reilroad trecks. The piers include 9-foot long remped collision posts at their bases. As built, the bridge had 18 feet of clearence above the reil, e distence thet hes baen increesed since tha tima of originel construction. The main span consists of 12 perellel, built-up, riveted, steel plate girders encesed in concrete, cest integrally with the 8-inch thick reinforced concrete deck slab. The two epproech spens eech consist of 11 reinforcad concrete T-beams that ere integrelly cest with the concrete deck. This structure is integrally cast with the verticel ebutment wells to form a continuous rigid freme. The center spen girders ere supported on the piers, end rest on expension joints loceted in the intersticas betwean tha epproech span T-beams. The ebutments consist of reinforced concrete bents on spreed footings. The approech walls and ebutments ere filled with gravel. The south epproech spans a peved eccass road. A concrete stairway with e steel pipe reiling is loceted et the southeast corner of the bridge end leeds from the roedway to the track level.

The decoretive scheme on the bridge is spare. The bere concrete surfece of the bridge is rubbed smooth, with rectangular, bush hammered penels on the parapet reilings. Each reiling conteins three recessed panels in the epproach spens end five in the center spen. These decoretive panels are continued on the approach reilings. The parapets also include a simple cast reiling and end posts. The end posts include blue-on-white enemel identification tiles conteining the bridge neme, number, contractor, and responsible stete agency, the Rhode Island Board of Roeds and 8ridges.

PART II HISTORICAL INFORMATION

The Mein Street Bridge in South Kingstown, Washington County, Rhode Islend, spans the Netionel Railroed Passenger Corporetion (Amtrek) Northeest Corridor, e high-speed passenger reil line thet connects Boston, New York City, 8eltimore, and Washington, D.C. This route originelly consisted of several passenger end freight railroads with end-to-end-connections, which were consolidated into the Amtrek system in 1971. The segment of the Northeest Corridor thet includes the Mein Street 8ridge wes originelly chertered in 1832 as the Providence end Stonington Reilroad. Construction began in 1832, and in 1833 the railroed merged with several new Connecticut and Messachusetts reilroads to form the New York, Providence and Boston, or the "Stonington Roed". This reilroed, elong with the Boston and Meine and the 8oston end Worcester wes one of the first three major railroads in New England. The Providence-to-Stonington segment thet includes the Main Street 8ridge was surveyed by Mejor George Weshington Whistler, noted railroad surveyor and fether of the peinter Jemes McNeill Whistler. In 1892 the Boston to New York line wes included in the growing New York, New Haven & Hertford Reilroad (New Heven) system. Through rail connection to New York City wes not realizad until the Thames River et Groton, Connecticut, was finally bridged in 1889 (Kerr 1995:124–126).

The Main Street Bridga, also known es Rhode Island Department of Trensportetion (RIDOT) Bridge Number 372, is a component of a massive roeds-and-bridgas program undertaken by the Rhoda Islend State Board of Public Roads in the 1920s and 1930s. This program included a new stata highway system, improvement of linking roads, end replacement of obsolescent bridges (Clouette and Roth 1985:32–33). The Main Street Bridge was a component of a cooperative grade crossing elimination project involving the Naw York, New Haven & Hartford Reilroad (New Haven Railroad). Tha Main Street Bridge project was funded through a special grade crossing elimination fund allotmant from the 1935 Emergancy Reliaf Appropriations Act, under which a portion of enginearing costs, all construction costs, and essential changes performed by tha New Haven Railroad, utilities, and local municipelitias were financed from the federal grant. The cooperative agreement elso stipuletad thet ell bridges be designad to accommodate four tracks undar their central spans, with space for one future additional track under each approach span. The bridge decks ware also designed so that the sidewelks could ba narrowed to accommodate additional future traffic lanes (Stata of Rhode Islend 192B:99, 1929:84, 1930:81, 1936:10[illegible]).

The construction contract for tha bridge, Fedarel Aid Project WPGH 47-C, wes awerded in Februery, 1936, to North Attleboro, Massachusetts contractor Frank T. Westcott, whosa bid of $117,368.3B was the lowest of the proposals submitted. A temporary timbar bridge was erectad to carry highway traffic while construction was in progress. The steel girders and trusses for the new Main Street 8ridge wera fabricated by the Bethleham Steel Corporation. Construction began March 16, 1936, and the bridge was completed on Decamber 19, 1936 et a total cost of $140,000 (Stete of Rhode Islend 1936:118–121).

Tha Main Street 8ridga, which combines both Melan- and rigid-frame construction, is significant es e well-preserved example of hybridized stenderd bridge construction types from the early twentiath century. The main span is darivativa of the Melan system, patantad by Joseph Melan for arch bridges in 1894 end edopted to straight spans by F.W. Patterson of Pittsburgh in 1898. In this dasign, main bridge spans are supported by riveted, built-up steel girders or trusses entirely encased in concreta. By 1905 bridge engineers hed determined that strategically-locatad conventionel ber rainforcement was adequete to withstand tensile strasses. Tha Melan encased girder configuration was considered redundant es the steel mambers were actually capable of carrying dead and live loads on their own, and tha concrate served no structural function (Condit 1961:195–218). The epproach spans of the Mein Street 8ridge are of rigid-frame construction, and "consist of [concrata T-] beams which ere connected by specielly-designed reinforcement steel with the pier end abutmant bents to form rigid fremes" (State of Rhode Island 1931:115). This cost-seving, wholly-reinforced, rigid-freme concrete bridge design became popular after World War I and was first used on a large scala in the 74 bridges of Arthur G. Hayden's Westchester Expressway in New York (Hayden 1931:1–4). This continuous-form structure was particularly adaptable to highway erches and encouraged the usa of comprehensive extarnel decoretive schemes. It was extensively employad in the construction of tha Merritt Perkway in Connecticut, es well as tha Graenwood and Hunt River bridgas.

The Main Streat Bridga is similar in appeerance and construction to savaral othar concreta highway bridgas erected by the 8ridge Department of the Rhoda Island Stata Board of Public Roads over the New York, New Havan & Hartford Railroad right-of-way in Rhode Island during tha 1930s, including the Hunt Rivar Road Bridge, North Kingstown (HAER RI-48), and tha Greenwood Reilroad 8ridge, Warwick (HAER RI-49). Rhode Island's highway bridge improvamant program began in 1912 with the formation of a separate 8ridge Division within the Rhode Island Stata Board of Public Roads. The bridge division director, Claranca L. Hussey (1885–1925), was Rhode Island's first bridge enginaer. Hussay was e nationelly-prominent bridge anginaer noted for his original contributions to the construction of concrate arch bridgas and concrete engineering tachnology, including en alegent, cost-

and weight-saving, modifiad-spandral, concrete-arch bridge design (Henderson 1926:1632-1633, Providence Sunday Journal 1925:3). Under Hussey, the bridge division utilized standardized plans for bridge replacement and selected concrete for the mejor bridge building material due to its strength, longevity, and low maintenanca requirements, as well as ease of construction. This factor encouraged the use of local contractors (Clouette and Roth 1988:31). These bridges also includad standardized features such as bush-hemmered, ractangular, decorative panels located so es to mesk joints, and blue-on-white glazed porcelain tilas at the parapat railing ends thet indicete the bridge name, number, contractor, and responsible stete agency, the Board of Public Roads.

The unusual combination of a monolithic, Melan-type concrete-encased, staal plate girder with an integrally cast deck, and rigid-frama, reinforced, concrete T-beam construction for tha approach spans, piers, and abutments was developed for the Main Street Bridge es it "provided a convenient method of supporting the concrete floor forms without independent centering supports that would heve been very complicatad due to the clearence required for reilroad operations" (State of Rhode Island 1931:115). This hybrid veriation wes e solution to logistical constraints rether than a trua enginaaring innovation. The Main Streat Bridga is ona of 318 steal stringer/multi-beam or girdar staal-and- concrate bridges constructed in Rhode Island between 1900 and 1991. This group of bridges demonstratas the versatility of multi-beam bridga construction in Rhode Island during the twentieth cantury. Only 33 of these bridges ware built before 1945, with the first of the collaborative railroad grade crossings built at Summit, Rhode Islend in 1927, meking the Main Street Bridga a relatively eerly locel exemple of the type (Adams and Tait 1994).

PART III SOURCES OF INFORMATION

A. Plena end Drawings

Rhode Island Dapertment of Transportetion, Plan Room.

B. Hiatoric Viewa

Rhode Island Department of Transportation. View of southerly elevation, ca. 1937. Claranca Hussey Bridge Photograph Collection photograph no. 372200.

C. Bibliogrephy

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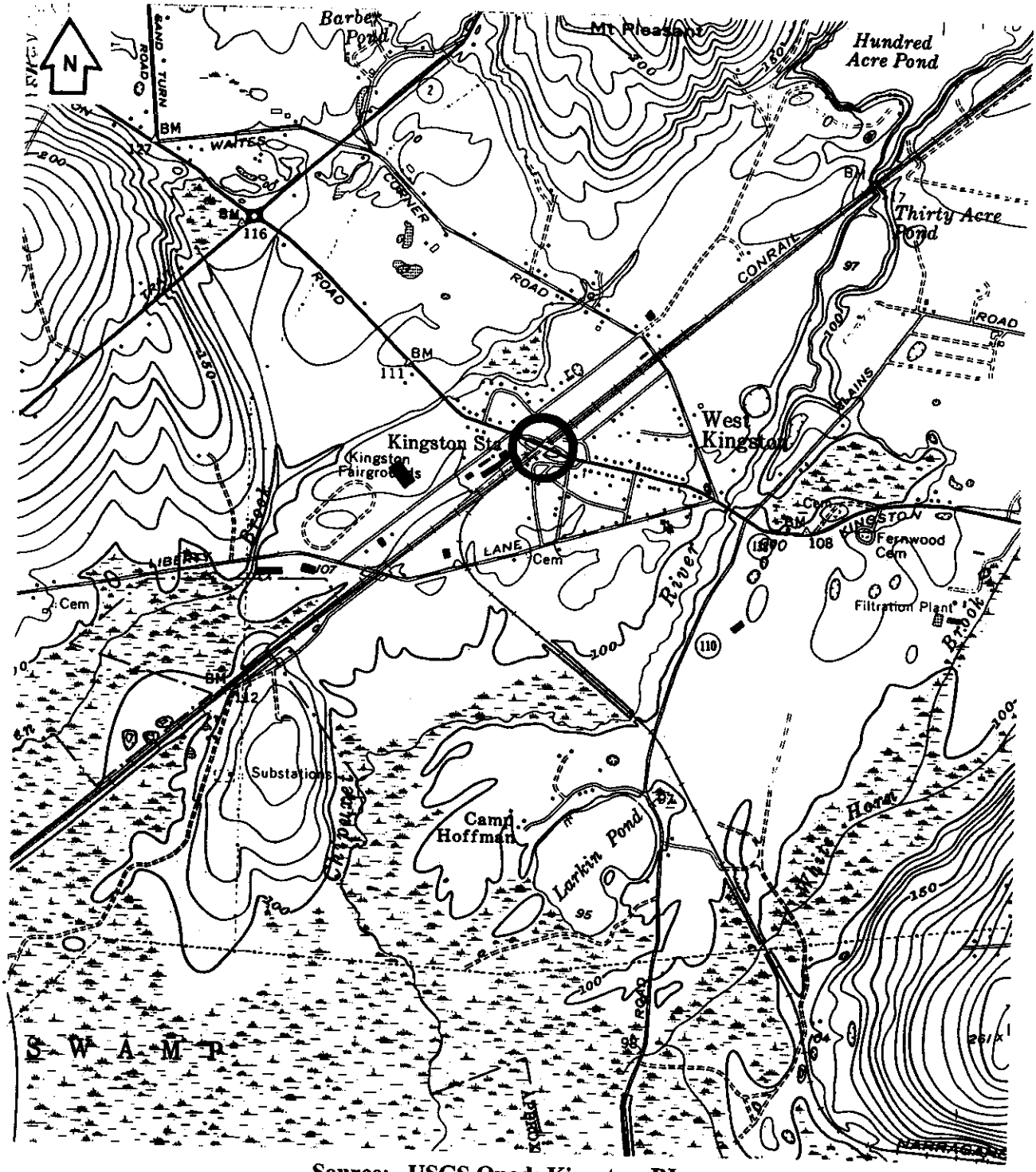
D. **Interviews**

Nona conducted

Location Map



Source: USGS Quad: Kingston, RI